Publication No. 035R002

INSTRUCTION MANUAL
FOR

POWER SUPPLY GPS-1B

(GDC PART NO. 035B001-005)

General DataComm Industries, Inc.
One Kennedy Avenue
Danbury, Connecticut 06810

MP MASTER
MA33472

Issue 2, September 1982

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Warning: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

Publication No. 035R002

GUIDE TO CHANGES IN THIS ISSUE

The following briefly describes the changes incorporated into this issue (revision) of the manual.

Issue 2, September 1982

Page 120-2. "+5 V" and "+12 V" added to test points; "100 V 50/60 Hz" and "NFPA TYPE II" deleted from nameplate data.

Page 150-0. In Figure 150-1, LINEAR RECTIFIER corrected to LINEAR REGULATOR at three places.

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SECTION 100 — GENERAL INFORMATION

1.0 INTRODUCTION

This manual provides instructions for installing and operating the GPS-1B Power Supply, GDC Part No. 035B001-005, hereafter referred to as the GPS-1B or the power supply. The GPS-1B is part of a comprehensive product line, designed and manufactured by General DataComm Industries, Inc., Danbury, Connecticut.

1.1 DIFFERENCE DATA SECTION

Difference Data Sheets that define the latest equipment modifications may accompany this manual. The cover sheet for each set of Difference Data Sheets is printed on buff paper and numbered and summarizes the changes as well as lists the affected pages. The updated (affected) pages are printed on pink paper and stapled to the cover sheet. Insert these pink pages into the appropriate sections of the manual and place the cover sheet along with the replaced, obsolete pages behind the cover sheet in Section 700 for future reference.

In some cases, the Difference Data Sheets will have been incorporated into the manual. The buff sheet will then appear in Section 700 with the obsolete pages immediately behind it. As a result, this manual will always be applicable to existing units previously delivered.

Should numbered subparagraphs (e.g., 1.1.1, 1.1.2, etc.) follow this paragraph, they will define each Difference Data Sheet already incorporated into this manual.

1.2 REPLY CARDS

The last page in this manual contains two postpaid return cards on which the user may comment on deficiencies in the manual or make suggestions for improving the manual. The cards are perforated for easy removal from the manual.

2.0 PURPOSE AND USE

The GPS-1B Power Supply is for use in time division multiplexer and frequency division multiplexer systems, rackmounted modem assemblies, or any other equipment requiring +5 V dc, +12 V dc, and -12 V dc from a common power supply.

3.0 TECHNICAL CHARACTERISTICS

Table 100-1 lists the technical characteristics of the GPS-1B.

4.0 PHYSICAL DESCRIPTION

The GPS-1B is a rackmounting unit, 3½ inches high by 16¼ inches deep (8.89 cm x 41.28 cm) with a standard 19-inch rack panel. The GPS-1B assembly consists of a chassis containing power supply transformer, choke, rectifiers, filters, power pass transistors, front and rear panels, and a component board assembly. A rear support bar is included for cabinet mounting and provision is made for center of gravity mounting brackets.

AC power is applied via a standard three-pin plug-in power cord at the rear panel EMI filter connector. AC circuit protection is provided by an eight-ampere (type 3AB) fuse adjacent to the power connector, an L-C-type EMI filter, which minimizes the effect of pulse and high-frequency line noise on power supply operation; a normally closed thermostat, which opens the ac power input if the main heatsink assembly temperature exceeds 100°C; and an R-C-type arc suppressor network across the output of the power switch, which minimizes the electrical transients due to switch bounce. Provision is made on internal terminal board TB1 for connecting chassis (safety) ground TB1-6 to dc circuit ground TB1-5 by a jumper with press-on (faston-type) terminals.

Remote alarm indication of power supply failure is available from internal form C relay contacts (contact rating: 10 W, 50 V, 0.5 A) via a six-pin RMT ALM connector (J2).

Isolated TEST POINTS -12 V, +12 V, GND, and +5 V are available on the chassis rear panel for test measurements. ALM BUS test jack J6 is available for connection of power supply to applicable system alarm bus. Output voltage terminal board TB4 is located on the rear panel and provides four system connection terminal points for +5 V, GND, +12 V, and -12 V. Each point has four heavy-duty faston-type tabs for external connection.

All operating controls and indicators are located on the front panel.

5.0 SPECIAL FEATURES

The GPS-1B has the capability for redundant operation by direct paralleling of the outputs of two or more power supplies. These power supplies can also be used for load-sharing applications where the load current cannot be satisfied by the maximum power supply output of a single supply.

Other special features include overvoltage protection (crowbar circuitry), sequencing circuitry, overtemperature alarm, and foldback current limiting.

TABLE 100-1. TECHNICAL CHARACTERISTICS

Item	Description
AC Input	
Voltage	100-130 V at 60 Hz
Current	7.5 A maximum
Fusing	8 A (type 3AB)
Leakage	0.5 mA maximum each line to safety ground at 115 V, 60 Hz
Static voltage (input to output)	2100 V dc maximum
Line noise attenuation	Line pulse noise (e.g., Beckman noise generator) measured at dc output terminals: -60 dB minimum
Efficiency at full load, nominal line	40% minimum
DC Output	
Output current	Output Voltage / Maximum Amperes +5 / 20.0 +12 / 2.0 -12 / 3.5
Tolerance (at power supply terminals)	+5 V: +3.5%, -1.5% +12 V: ±3% -12 V: ±3%
Permissible wire drops (including GND wire)	+5 V: 0.05 V maximum +12 V: 0.12 V maximum -12 V: 0.12 V maximum
Load sharing	Maximum load-current rating in shared connection: 100% of normal full load
Ripple voltage	1% peak-to-peak maximum each output
Transient response	Maximum excursion for 25% switched change in load shall fall within output tolerances

TABLE 100-1. TECHNICAL CHARACTERISTICS (Cont.)

Item	Description
Overvoltage protection	Range of trip voltages: +5 V 6.2–7.1 +12 V: 15.1–17.0 -12 V: 14.5–16.4
Line pulse noise rejection	Beckman noise generator supplying maximum noise signal (reading of 500 V peak on meter); there shall be no triggering of any of the three overvoltage protection circuits with power supply at any load between no-load and full-load.
Foldback current limiting	Maximum short circuit current (output to GND): Output Voltage — Amperes +5 — 12 +12 — 1.5 -12 — 1.5
NOTE *The power supply also sustains short circuits between output voltages, but in the case of a +5 V to -12 V short, the short-circuit current can only be sustained for approximately five seconds.*	
Sequencing	Power on: +5 V is inhibited (0 volts) until -12 V output exceeds -9.5 V Power off: Sequencer circuit recovery time at no-load (+5 V dropped to less than +1 V) is 15 seconds maximum after power turnoff
Remote alarm relay contact rating	Maximum voltage: 50 V Maximum current: 0.5 A Maximum power: 10 W
NOTE *Use external contact protection with inductive loads when connecting external circuits to J2.*	
Weight	45 pounds maximum
Environmental	
Ambient temperature	Operating: 0°C to +70°C Nonoperating: -40°C to +85°C
Altitude	Operating: 10,000 feet (3,048 m) with temperature derating Nonoperating: 50,000 feet (15,240 m)
Humidity	95% relative humidity without condensation

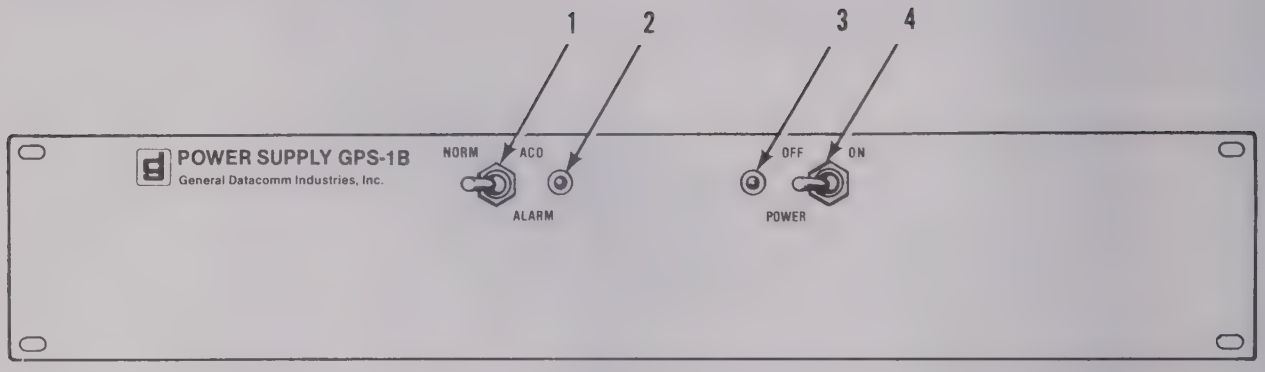
SECTION 120 — OPERATION

1.0 GENERAL

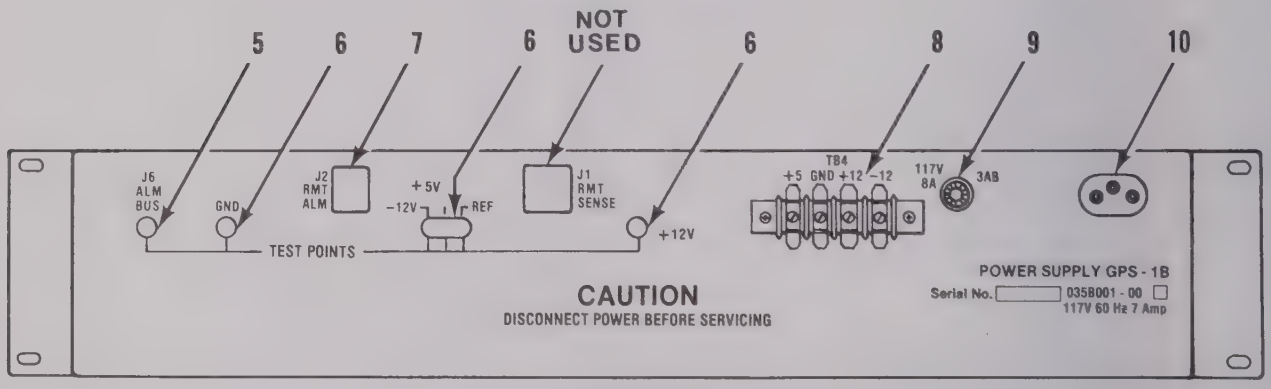
This section provides the operating instructions for the GPS-1B. Discussed are the front and rear panel components, the locations of which are indicated in Figure 120-1 and keyed by index numbers to descriptions in Table 120-1.

2.0 OPERATION

After the power supply is installed, it is an unattended device requiring no specific operating procedures.



A. FRONT PANEL



B. REAR PANEL

FIGURE 120-1. GPS-1B POWER SUPPLY, FRONT AND REAR PANELS

TABLE 120-1. GPS-1B FRONT AND REAR PANEL COMPONENTS

Index No.	Component	Functional Description
	FRONT PANEL	
1	NORM/ACO Switch (S2) NORM (Maintained)	Allows overtemperature, preregulator failure, or voltage failure ALARM signal to be bused to system alarm bus.
	ACO (Maintained)	Prevents ALARM signal from being bused to system alarm bus. However, alarm indicator remains illuminated.
2	ALARM Indicator (DS2)	Illuminates when power supply ambient temperature exceeds 65°C, or when preregulator failure or voltage failure occurs.
3	OFF/ON Indicator (DS1)	Illuminates when ac power is connected to primary circuit of power supply.
4	POWER OFF/ON Switch (S1) OFF (Maintained)	Disconnects ac power from primary circuitry of power supply.
	ON (Maintained)	Connects ac power to primary circuitry of power supply.
	REAR PANEL	
5	ALM BUS (J6)	Connects power supply to system alarm bus.
6	TEST POINTS (Protected) GND	Monitors dc circuit ground.
	+5 V, +12 V, and -12 V	Monitor dc output voltages inside redundant diodes; voltage typically 0.3 to 0.5 V dc higher than output voltage at TB4 when outputs are loaded.
	REF	Monitors output of reference generator.
7	RMT ALM Connector (J2)	Provides connection for system remote alarm.
8	TB4	
	+5, GND, +12, -12	Provides connection for loads and redundant power supply, using faston-type terminals.
9	Fuse (F1) (117 V, 8 A, 3AB)	Provides overload protection.
10	EMI Filter and ac line connector	Minimizes effect of pulse and high-frequency line noise and provides connector for ac line cord.

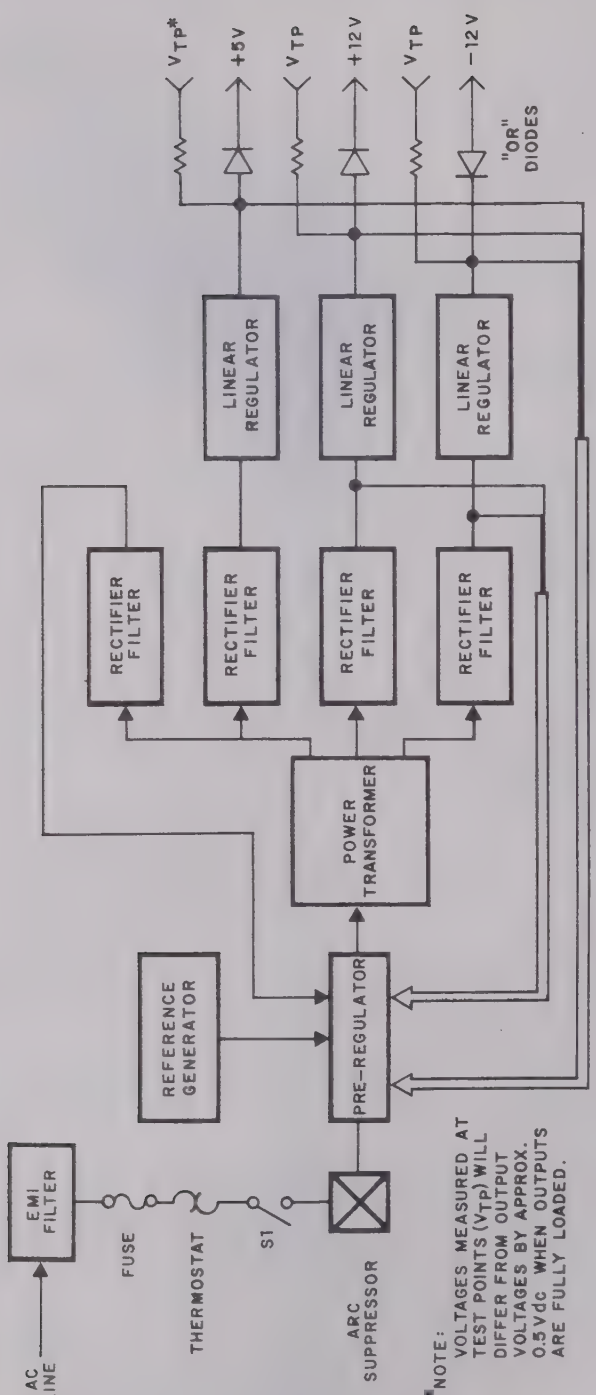


FIGURE 150-1. GPS-1B POWER SUPPLY, FUNCTIONAL BLOCK DIAGRAM

SECTION 150 — PRINCIPLES OF OPERATION

1.0 INTRODUCTION

This section describes the general circuit functions of the GPS-1B Power Supply. The text is organized around the GPS-1B functional block diagram, Figure 150-1, which identifies major circuit functions, and the schematic diagrams.

2.0 GPS-1B PRINCIPLES OF OPERATION

The power supply generates +5 V dc, +12 V dc, and −12 V dc using three linear regulators and a switching type of preregulator to minimize power losses in the linear regulators. A reference generator sets the operating point of the regulators and the preregulator.

2.1 AC CIRCUIT PROTECTION

The L-C-type EMI filter minimizes the effect of pulse and high-frequency line noise on the operation of the power supply. A type 3AB, 8-amp fuse is provided in the ac line. A normally closed thermostat is mounted on the main heatsink assembly. It opens the ac power input if the main heatsink assembly temperature exceeds 100°C (open at 104±7°C). An R-C-type arc suppressor network is connected across the output of the power switch to minimize the electrical transients due to switch bounce.

2.2 REFERENCE GENERATOR

The reference generator is shown in Figure 150-2. The operating points of the three linear regulators as well as the preregulator are set by a common reference voltage produced by the generator. The precision variable divider, which is set by means of a factory-select resistor, converts the stable, temperature-compensated reference voltage output of the IC regulator to the reference generator voltage output. Loading errors on the divider are prevented by isolating the output with the voltage follower operational amplifier permitting a single onetime adjustment for all the regulators.

2.3 PREREGULATOR

The functional block diagram of the preregulator is shown in Figure 150-3. The preregulator minimizes power dissipation in the linear regulators by maintaining the differential voltage drop across the most heavily loaded of the three linear regulators at a minimum value which prevents feedthrough of ripple voltage. The controlling action of the preregulator is as follows: At the start of a power line half cycle, the triac switch is open and coil L_A of control choke L1 is a simple inductor in series with the primary of T1. Filter capacitors C1, C2, C3, C4, and C5 charge until the last of the three linear regulators (usually the most heavily loaded) reaches the minimum differential voltage preset by the reference generator. At this time, the triac control circuit fires the triac switch, putting coil L_B into the circuit that changes the function of L1 from a series inductor to a stepdown auto-transformer. The sudden reduction in transformer primary voltage stops the charging of C1, C2, C3, C4, and C5. The closing of the triac switch also provides a path for the stored energy in L1 to return to the power line while the dc load currents are supplied by the discharge of C1, C2, C3, C4, and C5. The triac switch remains closed for the remainder of the power line half cycle, after which it opens. The cycle is then repeated for the next power line half cycle. The process is theoretically lossless and the presence of L_A during capacitor charging provides bilateral noise isolation between line and loads.

2.4 LINEAR REGULATORS

The +5 V and +12 V linear regulators use low power IC regulators with medium power driver transistors (on the card) in conjunction with power heatsink-mounted pass transistors. The −12 V regulator uses operational amplifiers in combination with discrete transistors connected so the same driver transistor and power transistor can be used. In this case, the load is in the power transistor collector circuit rather than the emitter circuit as in the +5 V and +12 V regulators.

2.4.1 **Power Sequencing** — Sequencing circuitry provides the three output voltages at power turn-on in a definite sequence of: −12 V, +12 V, and +5 V.

2.4.2 **Overvoltage Protection** — All three outputs include crowbar circuitry to prevent damage to the load due to overvoltage. When any crowbar circuit is tripped, power must be shut down before returning to normal operation. The voltage levels at which the crowbar circuit trips are described in Table 100-1.

2.4.3 **Current Limiting** — All three linear regulators include foldback current-limiting circuitry for overload or short-circuit protection. See Table 100-1

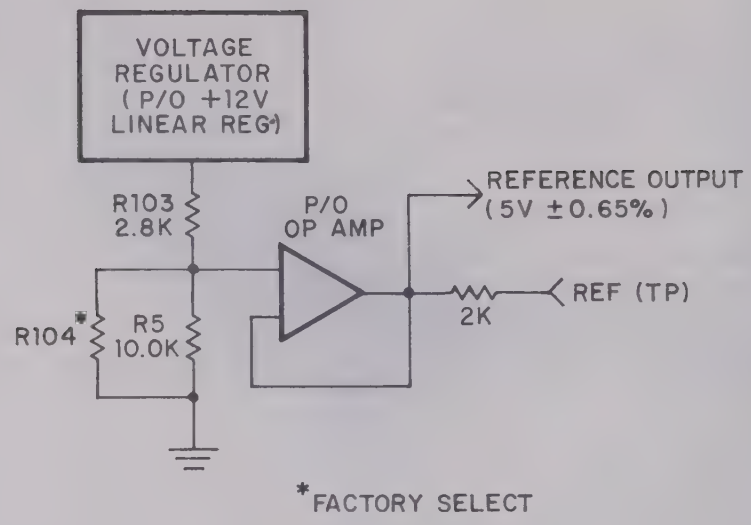


FIGURE 150-2. REFERENCE GENERATOR

for maximum short-circuit current value supported at each output voltage value.

2.5 ALARMS

The GPS-1B includes an overtemperature alarm (a normally open thermostat S2 which closes at 65°C free air temperature), preregulator failure, and voltage failure alarm. Any alarm energizes a rear chassis jack (which can be connected to the system alarm bus) and lights a front panel ALARM indicator (LED). The front panel ACO/NORM switch deenergizes the jack, but not the indicator. The voltage failure alarm also provides for remote voltage failure indication via form C relay contacts available at the rear chassis RMT ALM connector. (Refer to Figure 150-4.) In redundant systems, redundant excitation for the alarm bus and indicator is provided by the mating power supply.

2.6 REDUNDANT CAPABILITY

Redundant operation of the GPS-1B is provided by direct paralleling of the outputs of two or more power supplies. Isolation between power supplies is accomplished by power "OR" diodes mounted on a heatsink. Since the linear regulators sense output at the power supply output terminals, the drop in the isolating diodes is compensated and since the preregulator controls the differential voltage across the linear regulators, no special adjustment is required to compensate the diode drops.

Through this redundant capability, two or more GPS-1B units can be used for load-sharing applications where one or more of the load currents cannot be satisfied by the maximum single power supply output. Where multiple power supplies are paralleled for load sharing, an additional power supply (over and above those needed to supply the load) can be paralleled for redundancy.

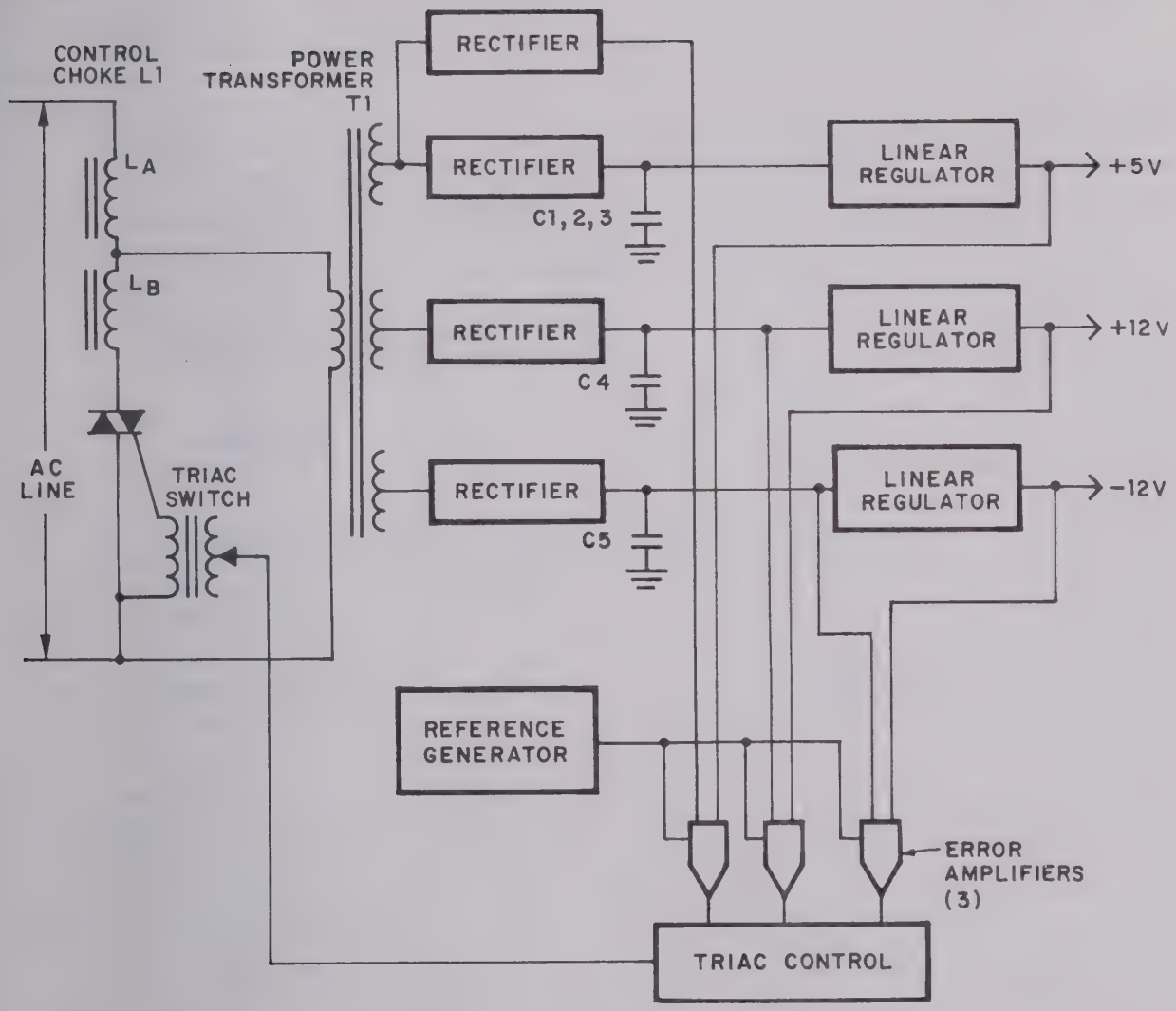
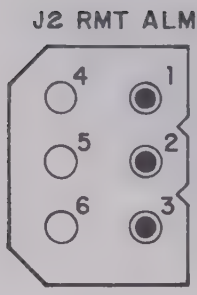


FIGURE 150-3. PREREGULATOR, FUNCTIONAL BLOCK DIAGRAM



FUNCTION	FROM CARD	TO PIN
N.O. CONTACT	E13	J2-1
COM CONTACT	E14	J2-2
N.C. CONTACT	E15	J2-3

FIGURE 150-4. REMOTE ALARM CONNECTOR J2

SECTION 200 — INSTALLATION

1.0 GENERAL

This section contains information for installing the GPS-1B. Also included are instructions for unpacking and handling, initial receipt inspection, connection to external equipment, and preoperational checkout of the power supply unit.

2.0 UNPACKING, INSPECTION, AND PREPARATION

The following instructions should be observed when installing the GPS-1B.

a. Unpack unit as follows:

(1) Open cardboard shipping container and remove packing cardboard and filler material, if any.

CAUTION

Weight of power supply is approximately 45 pounds.

(2) Lift GPS-1B unit from shipping container and place on a convenient sturdy working surface. Remove tape and additional filler material from unit.

NOTE

Do not discard shipping container or packing material; save for transporting or reshipping, if necessary.

b. Inspect the unit for visible signs of damage. If any damage is evident, take appropriate steps to notify GDC immediately.

c. Inventory all items enclosed with the power supply for agreement with packing list.

CAUTION

Do not apply primary power until all connections have been made and checked.

d. Depending on type of installation, either

(1) Carefully place power supply on cabinet support shelf and slide into cabinet; or

(2) Secure to front of rackmounting rails with attaching hardware.

NOTE

Vertical spacing of one-inch minimum between redundant power supplies, and between power supply and any other equipment is required.

e. Before connecting external equipment, a confidence check of output voltages may be made by taking measurements at the rear panel test points and at terminal block TB4 using a Simpson 260 multimeter or equivalent (20,000 ohms/volt minimum). Follow these steps:

(1) Check fuse. Ensure POWER switch is OFF and ACO/NORM switch is in NORM.

(2) Connect three-pin ac line power cord to EMI filter connector.

(3) Connect power cord to power source meeting ac input requirements of Table 100-1.

(4) Set POWER switch to ON. POWER ON indicator illuminates.

(5) Check that output voltages at rear panel are in accordance with Table 100-1.

If the proper voltages are measured, proceed with the installation at step f; otherwise, see Section 300, Maintenance, for further information.

f. Set POWER switch to OFF.

g. Connect load wiring to application terminal board TB4 terminals +5, GND, +12, and -12.

h. Interconnect redundant power supplies (where applicable) at the redundant power panel (GDC Part No. 310C012-001). Wire lengths shall be equal from the power supplies to the redundant power panel.

i. Connect system power supply remote alarm connector to J2 (RMT ALM) connector. See Figure 150-4 for connections.

j. Set POWER switch to ON. Connected external equipment should now be powered for proper operation.

SECTION 300 — MAINTENANCE

1.0 INTRODUCTION

This section contains preventive and corrective maintenance procedures for the GPS-1B Power Supply. Maintenance is limited to diagnosing problems from visual checks of the GPS-1B unit and its cables.

2.0 PREVENTIVE MAINTENANCE

Preventive maintenance for the power supply consists of periodically:

a. Checking rear panel test points for correct voltages.

b. Inspecting cable connections for loose connections or damaged wiring. This inspection should include the press-on connections of the power supply cables to external equipment, and also the ac line cord.

WARNING

The ac line cord of this power supply is polarity-sensitive. Defective line cords should be replaced with GDC Part No. 830002-005 line cord only; otherwise, a hazardous condition may exist.

c. Removing dust accumulations (with primary power disconnected) from the perforated covers of the GPS-1B unit and the heatsinks inside the unit using a vacuum cleaner equipped with a soft brush.

3.0 TECHNICAL ASSISTANCE PROCEDURE

If the above troubleshooting procedures fail to remedy the malfunctioning equipment, contact DataComm Service Corporation for technical assistance. Customers located outside Connecticut may call our toll-free number, 1-800-243-9228, 24 hours a day; Connecticut customers should call our main number, 797-0711, during regular business hours (8:30 a.m. to 5:00 p.m.) and 797-0920 after business hours. (DataComm Service Corporation is a subsidiary of General DataComm Industries, One Kennedy Avenue, Danbury, Connecticut 06810.)

4.0 RETURNING DEFECTIVE EQUIPMENT

Defective equipment may at any time be returned to the GDC factory for repair. Pack the equipment securely in the original packing material. Take appropriate steps to return the defective equipment. Fill out the enclosed tag and address the package:

Product Repair Department
General DataComm Industries, Inc.
One Kennedy Avenue
Danbury, Connecticut 06810

SECTION 600 — PARTS LISTS

1.0 GENERAL

This section is to be used to procure repair parts for the GPS-1B Power Supply. Tables 600-1 through 600-6 list parts by GDC part number, description, and reference designation.

TABLE 600-1. GPS-1B POWER SUPPLY, PRINTED CIRCUIT BOARD ASSEMBLY (PART NO. 035P001-005)

Qty Per Assy	GDC Part No.	Description	Ref Designation
1	035P001-102	Circuit Board	
5	300007-100	Resistor	R22,27,47,64,72
4	300007-101	Resistor	R21,61,68,84
2	300007-103	Resistor	R54,81
11	300007-122	Resistor	R18,28,29,36,40,41,55,62,67,71,85
1	300007-181	Resistor	R19
5	300007-202	Resistor	R38,39,50,52,53,86-89
3	300007-223	Resistor	R30,37,44
3	300007-470	Resistor	R34,42,93
6	300007-471	Resistor	R31,32,43,51,63,73
2	300007-472	Resistor	R20,83
2	300007-560	Resistor	R77,79
3	305056-FS#	Resistor	R104-106
1	305056-101	Resistor	R33
1	305056-161	Resistor	R95
2	305056-174	Resistor	R94,96
1	305056-181	Resistor	R60
1	305056-185	Resistor	R59
2	305056-222	Resistor	R98,99
2	305056-230	Resistor	R107,110
1	305056-235	Resistor	R6
1	305056-244	Resistor	R103
1	305056-247	Resistor	R35
1	305056-256	Resistor	R9
2	305056-264	Resistor	R58,97
1	305056-268	Resistor	R108
4	305056-269	Resistor	R24,25,45,49
1	305056-272	Resistor	R8
1	305056-291	Resistor	R100
2	305056-293	Resistor	R56,66
1	305056-299	Resistor	R16
5	305056-301	Resistor	R5,14,17,74,78,109
1	305056-309	Resistor	R90
8	305056-310	Resistor	R23,26,46,48,57,65,66,91
1	305056-315	Resistor	R92
5	305056-320	Resistor	R10-12,15,101,102
1	305056-330	Resistor	R75
1	305056-342	Resistor	R13
1	305056-374	Resistor	R82

TABLE 600-1. GPS-1B POWER SUPPLY, PRINTED CIRCUIT BOARD ASSEMBLY (PART NO. 035P001-005) (Cont.)

Qty Per Assy	GDC Part No.	Description	Ref Designation
3	405002-103	Capacitor	C5,7,9
5	405003-103	Capacitor	C2,6,8,21,27
1	405003-203	Capacitor	C20
1	405006-024	Capacitor	C22
2	405006-124	Capacitor	C1,19
3	405007-102	Capacitor	C13-15
3	430001-030	Capacitor	C3,24,26
1	430001-032	Capacitor	C4
2	430001-078	Capacitor	C23,25
3	435001-065	Capacitor	C10-12
3	540006-001	IC, op-amp	U1,2,4
2	540015-001	IC, voltage reg	U3,5
1	540025-012	IC, voltage reg	VR9
1	540026-012	IC, voltage reg	VR10
1	540032-001	IC, voltage comp	U6
3	600001-001	Transistor	Q3,9,17
5	601001-001	Transistor	Q1,6,7,11,18
3	613001-001	Transistor	Q4,10,13
1	618001-001	Transistor	Q2
14	650001-001	Diode, switching	CR1-8,12,13,18-21
1	655001-002	Diode, rectifier	CR17
3	655003-001	Diode, rectifier	CR14-16
2	660001-006	Diode, zener	VR7,8
1	660001-008	Diode, zener	VR4
2	660001-014	Diode, zener	VR2,6
3	660001-017	Diode, zener	VR1,3,5
1	665003-001	LED	DS1
3	690002-001	SCR, 50V, 20A	Q8,12,14
1	690003-005	Triac, 400V, 8A	Q3
1	720003-001	Transformer, pulse	T1
6	205001-003	Jack	J1-6
1	214004-101	Switch	S1
1	217020-224	Relay, 24V, 2A	K1

TABLE 600-2. GPS-1B POWER SUPPLY, RACKMOUNT BOX UNIT (PART NO. 035B001-005)

Qty Per Assy	GDC Part No.	Description	Ref Designation
1	016C006-001	Transformer	T1
1	035C001-003	Heatsink assy	HT-ASY-2
1	035C001-004	Heatsink assy	HT-ASY-1
1	035C002-003	Heatsink assy	HT-ASY-4
1	035C003-002	Heatsink assy	HT-ASY-3
1	035C004-001	Choke assy	
1	035D001-002	Chassis	
1	035D002-002	Panel, front	
1	035H001-001	Wiring harness	
1	035P001-005	Printed circuit board	
1	212005-001	Switch, toggle, DPDT	S1
1	212005-101	Switch, toggle, SPDT	S2
1	215301-013	Fuse, 250V, 8A ceramic	F1
1	216001-001	Holder, fuse	XF1
2	234002-001	Arrestor, surge, 130V	RV1,2
1	300007-202	Resistor	R7
1	425001-421	Arc suppressor, 250V	RV3
1	430001-012	Capacitor	C7
5	435002-004	Capacitor	C1-5
1	665003-001	LED	DS1,2
1	780002-005	Filter, EMI	J3
1	830002-005	Line cord, ac	P1

TABLE 600-3. GPS-1B POWER SUPPLY, HEATSINK ASSEMBLY (PART NO. 035C001-003)

Qty Per Assy	GDC Part No.	Description	Ref Designation
1	016D007-001	Heatsink	
3	310001-101	Resistor	R1,2,4
2	612003-002	Transistor	Q1,4
1	612006-001	Transistor	Q2

TABLE 600-4. GPS-1B POWER SUPPLY, HEATSINK ASSEMBLY (PART NO. 035C001-004)

Qty Per Assy	GDC Part No.	Description	Ref Designation
1	016D007-001	Heatsink	
3	310001-101	Resistor	R3,5,6
1	430001-044	Capacitor	C6
2	612003-002	Transistor	Q5,6
1	612006-001	Transistor	Q4

TABLE 600-5. GPS-1B POWER SUPPLY, HEATSINK ASSEMBLY (PART NO. 035C003-002)

Qty Per Assy	GDC Part No.	Description	Ref Designation
1	035D004-001	Heatsink	
2	655004-102	Diode, rectifier	CR5,6
2	675001-002	Rectifier, full-wave	BR1,2

SECTION 650 — DIAGRAMS

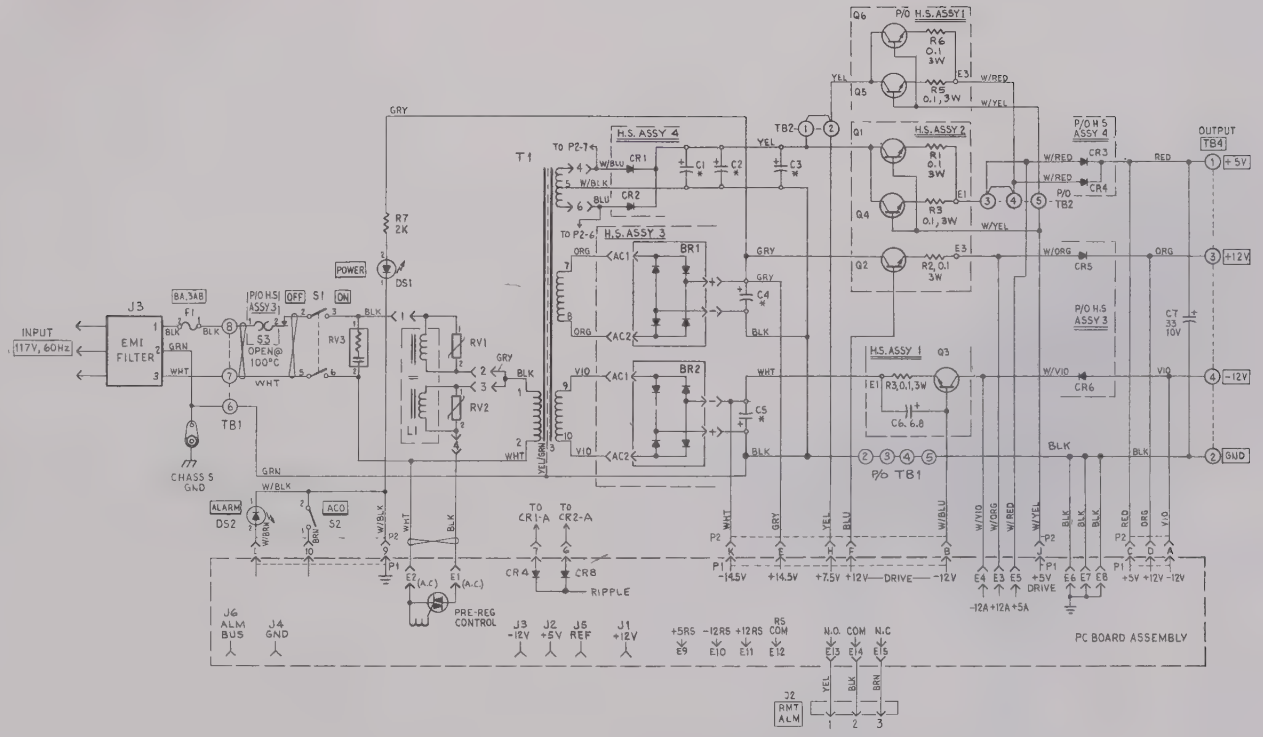
1.0 GENERAL

This section contains drawings intended for reference by the technician. The drawings herein are essential for servicing the module. The schematic diagram and the component board assembly will aid the technician in isolating malfunctions within the module.

In some cases, the first sheet (sheet 1) of the original schematic diagram set is blank and therefore will not be included in a manual. If this is the case, the connector bubbles (or "air-line" interconnects) that are used to connect signals from one schematic page to another have not been changed in the manual to reflect this. (For example, sheet 1 of the manual's schematic diagram would be sheet 2 of the original schematic diagram set.) The technician should take that into account when using the schematic diagram.

Recent practice has eliminated the blank first sheet from the original schematic diagram set, in which case the original sheet numbering conforms to the sheet numbering in the manual.

Both numbering systems may appear in one manual if more than one schematic diagram is involved.



PUB REV LEV — —

FIGURE 650-1. GPS-1B POWER SUPPLY, SCHEMATIC DIAGRAM (035S004-001)

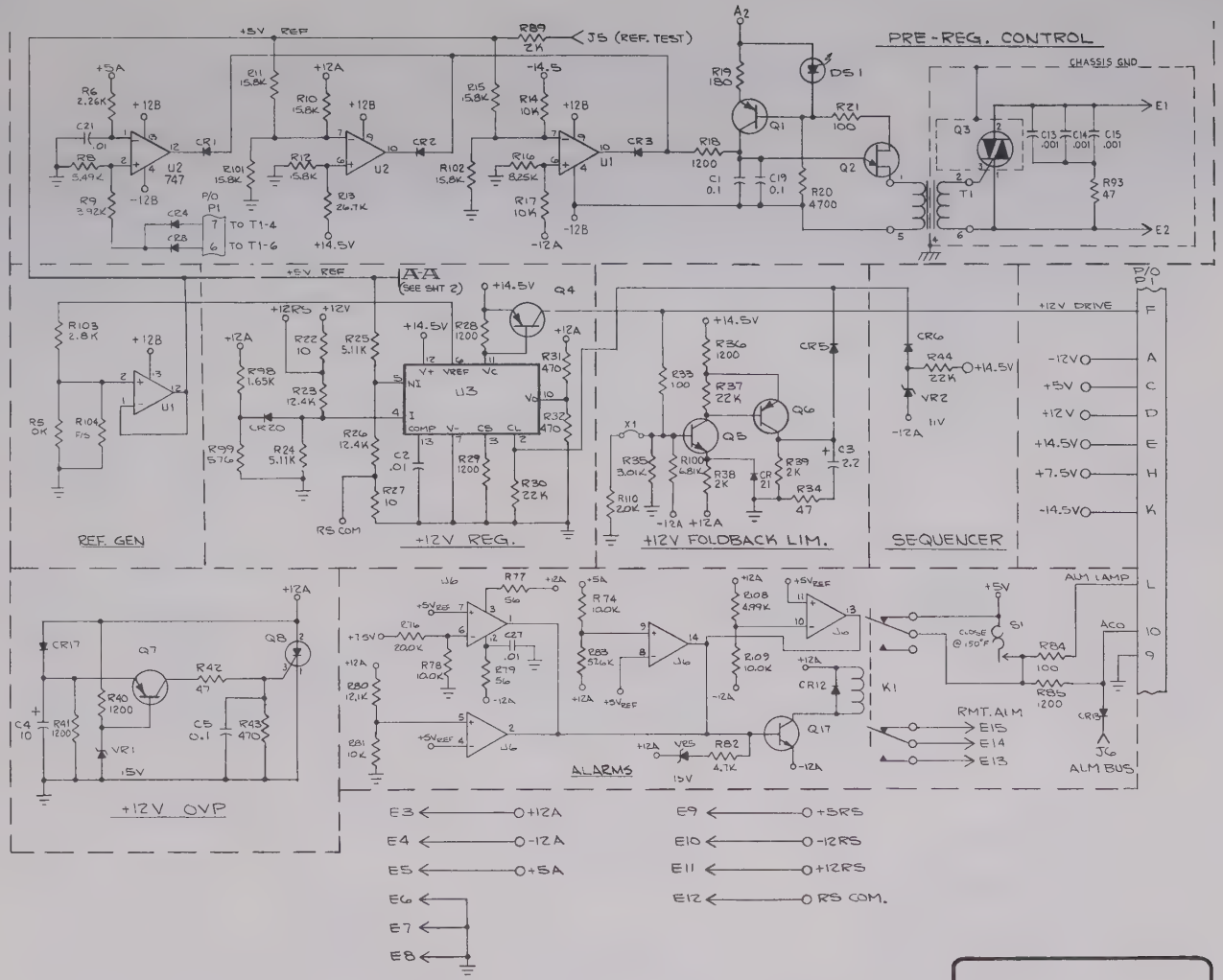


FIGURE 650-2. GPS-1B POWER SUPPLY, PRINTED CIRCUIT BOARD, SCHEMATIC DIAGRAM (035S001-005) (Sheet 1 of 2)

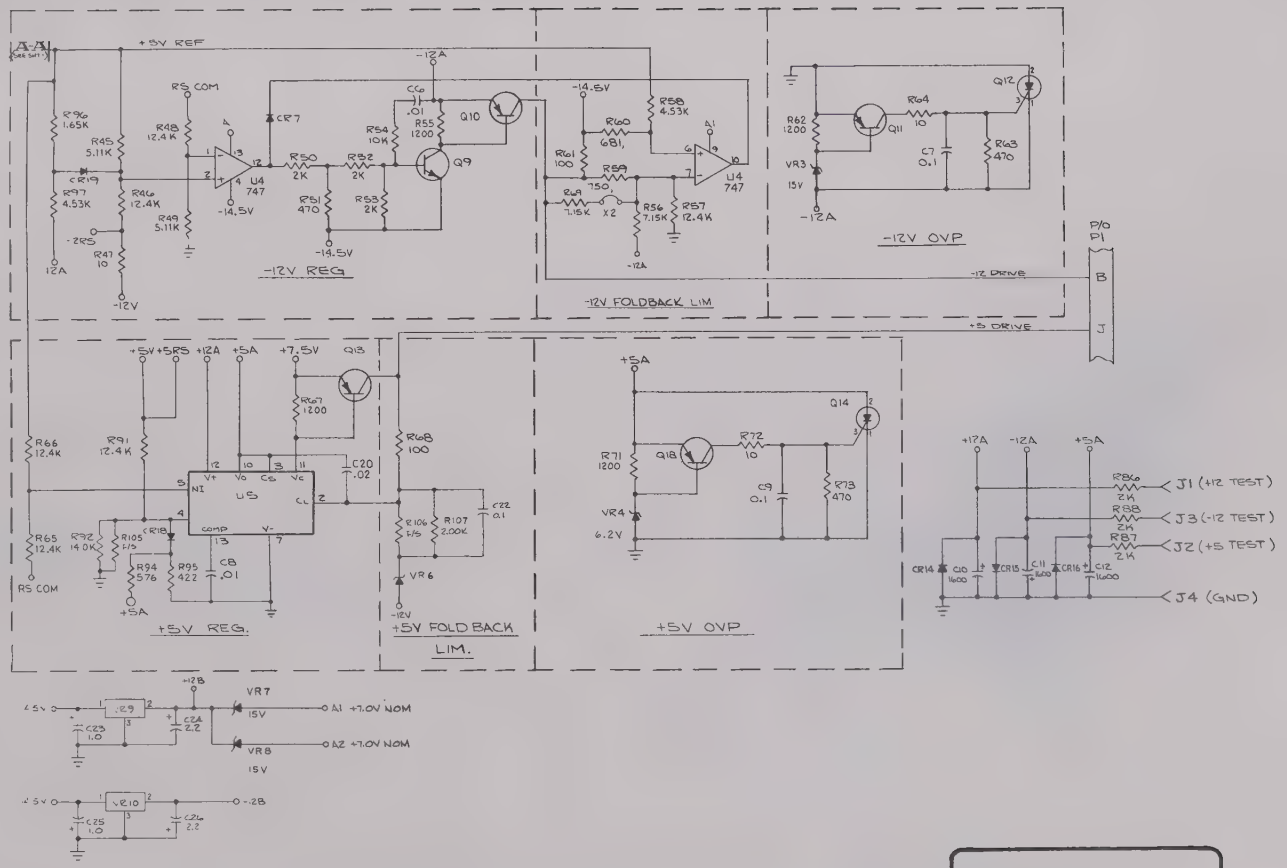


FIGURE 650-2. GPS-1B POWER SUPPLY, PRINTED CIRCUIT BOARD, SCHEMATIC DIAGRAM (035S001-005) (Sheet 2 of 2)

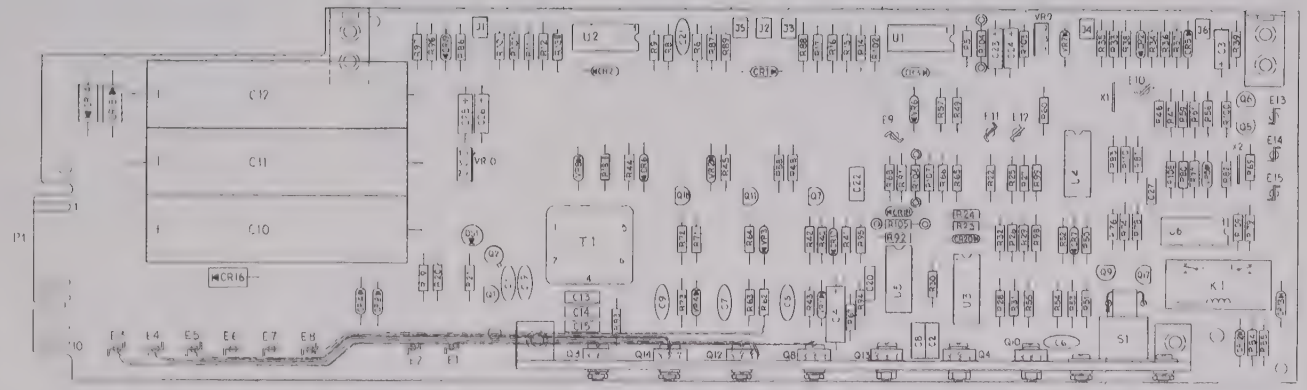


FIGURE 650-3. GPS-1B POWER SUPPLY, PRINTED CIRCUIT BOARD ASSEMBLY (035P001-005)

SECTION 700 — DIFFERENCE DATA

1.1 GENERAL

Individual Difference Data Sheets are prepared to cover modifications to GDC equipment. As these changes occur they are incorporated into the equipment. The Difference Data Sheets include a cover sheet which is sequentially numbered and printed on buff paper and briefly describes the modification as well as provides a list of pages affected in this manual. Initially, the affected pages are updated and printed on pink paper and stapled to the cover sheet. These are attached to the top of the basic manual. The pink pages are to be inserted into the appropriate sections of the manual in place of the identically numbered white pages. The buff Difference Data cover sheet then should be placed in Section 700 with the removed, obsolete pages behind it for future reference. At the next printing of this manual, the Difference Data cover sheet will be printed on buff paper and bound into the manual in Section 700 along with the obsolete pages. (Paragraph 1.1 in Section 100 will so state when this has been done.) The new pages will be bound in the appropriate sections of the manual. In this way the manual will cover both the latest equipment and the unmodified equipment previously delivered.

1.2 PRINTED CIRCUIT CARD REVISION DESIGNATORS

Modifications of printed circuit cards or of plug-in ("piggyback") elements of these cards, and revisions of supporting diagrams are indicated by letter and number codes on the printed circuit card. Brief explanations of these codes are presented below. Refer to Figure 700-1.

1.2.1 **Assembly Number** — Each printed circuit card is usually marked on its component side with a number that identifies its physical configuration (see Figure 700-1, B). The digits before the box form a base number which is assigned to the original and remains unchanged regardless of subsequent modifications. The digits following the box — the so-called dash number — are used when a basic design is offered in several versions concurrently and the mechanical assembly prints for the various versions coexist under different dash numbers. In addition, dash numbers are changed or added when a physical modification is made to the card (that is, new application) which changes the card so that it is no longer a replacement for the original dash number. The letter appearing in the PUB REF REV LEV box on the mechanical assembly drawing (component location diagram) in the manual is for publication use only.

1.2.2 **Printed Circuit Identifier** — The base digits of the assembly number also appear on the opposite surface of the card where they identify the printed circuit configuration (see Figure 700-1, A). In this case the last three digits are always "101." The suffix letter ("C" in Figure 700-1, A) is changed when the pattern of printed conductors ("artwork") on the card is revised, and designates the printed circuit configuration incorporating these changes.

1.2.3 **Schematic Revision Letters** — Any circuit change which entails revision of the schematic diagram, is indicated by the letter appearing after the assembly number on the component side (Figure 700-1, B). The circuit configuration represented by this letter is a direct replacement for all previous production versions.

For a piggyback element, a change involving the revision of the schematic diagram, is indicated by a letter appearing before the printed circuit identifier (Figure 700-1, A). Likewise, the circuit configuration represented by this letter supersedes all previous production versions.

The letter appearing in the PUB REF REV LEV box on the schematic diagram in Section 650 of the manual, identifies the configuration of the unit represented by the associated diagram. The PUB REF REV LEV letter on the schematic diagram in the manual and the schematic revision letter on the unit serve the same function.

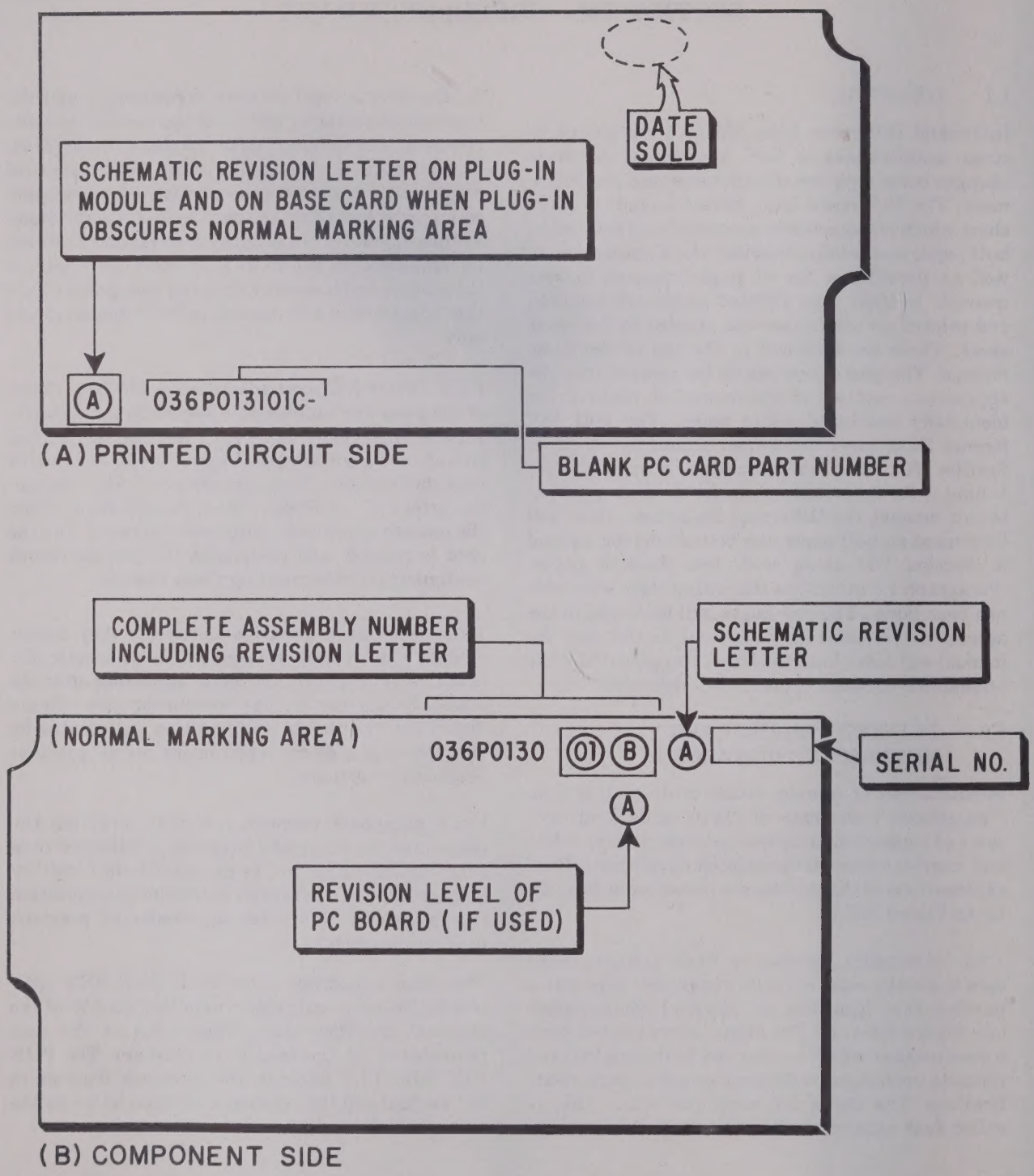


FIGURE 700-1. PRINTED CIRCUIT CARD REVISION DESIGNATORS

GDC's goal is to provide technical manuals that match the high quality and dependability of our manufactured products. Thus GDC wishes to be informed of any procedures which, in your opinion, are inaccurate, deficient, or prove impractical in the field. Simply fill in one of the attached cards, tear it out and drop it in the mail. Thank you.

PRODUCT NAME AND TYPE NO. _____

PUBLICATION NO. _____ ISSUE AND DATE _____

PROBLEM AREA			SUGGESTIONS
Section	Para., Fig., or Table No.	Pg. No.	

GENERAL REMARKS:

NAME _____ COMPANY _____

TITLE _____ ADDRESS _____

_____

PRODUCT NAME AND TYPE NO. _____

PUBLICATION NO. _____ ISSUE AND DATE _____

PROBLEM AREA			SUGGESTIONS
Section	Para., Fig., or Table No.	Pg. No.	

GENERAL REMARKS:

NAME _____ COMPANY _____

TITLE _____ ADDRESS _____

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